

I CLAIM:

1. An arrangement in a circulating fluidized bed reactor system, the arrangement comprising:
 - a reaction chamber, having a fluidized bed of solid particles therein, and being defined by a ceiling, a bottom, and walls, which are at least partially formed by water tube panels;
 - means for introducing fluidizing gas into said reaction chamber;
 - at least one discharge opening arranged in the walls of said reaction chamber for removing a particle suspension of exhaust gases and solid particles from said reaction chamber;
 - at least one particle separator connected to said discharge openings, for separating the solid particles from the particle suspension, each of said particle separators having a gas discharge opening in an upper part thereof, for discharge of cleaned exhaust gases, each of the gas discharge openings being connected to a discharge duct;
 - a heat recovery section, to which the cleaned exhaust gases are directed; and
 - a gas plenum, defined by an enclosure comprising a ceiling, a bottom, and walls, positioned above and integrated with said reaction chamber, for directing the cleaned exhaust gases discharged from said at least one particle separator to said heat recovery section, said gas plenum being provided with at least one exhaust gas inlet opening arranged in the walls thereof for receiving the cleaned exhaust gases from the discharge duct of said at least one particle separator and directing the cleaned exhaust gases to said gas plenum, said gas plenum also being connected to a connecting channel downstream of said gas plenum for leading the cleaned exhaust gases from said gas plenum to said heat recovery section,
 - wherein the enclosure of said gas plenum is formed by water tube panels as extensions of the water tube panels of said reaction chamber.
2. An arrangement in accordance with claim 1, wherein at least a portion of the bottom and of the walls of the enclosure of said gas plenum is formed in such a way that an extension of the water tube panel that forms a first one of the walls of said reaction chamber is (i) bent

at the upper edge of the first wall of said reaction chamber and extended toward an opposite, second one of the walls of said reaction chamber, (ii) bent 180 degrees and extended to the lower edge of one of the walls of said gas plenum that is directly above the first wall of said reaction chamber, and (iii) bent upward and extended to the upper edge of the wall of said gas plenum that is directly above the first wall of said reaction chamber.

3. An arrangement in accordance with claim 1, wherein at least a portion of the bottom and of the walls of the enclosure of said gas plenum is formed in such a way that extensions of the water tube panels that form two opposite walls of said reaction chamber are (i) bent toward each other at the respective upper edges of the two walls and extended in such a way that the extensions meet, (ii) bent 180 degrees and extended to the lower edges of respective opposite walls of said gas plenum that are directly above the two opposite walls of said reaction chamber, and (iii) bent upward and extended to the upper edges of the respective opposite walls of said gas plenum.

4. An arrangement in accordance with claim 1, wherein at least a portion of the bottom and of the walls of the enclosure of said gas plenum is formed in such a way that an extension of the water tube panel that forms a first one of the walls of said reaction chamber is (i) bent at the upper edge of the first wall of said reaction chamber and extended toward an opposite, second one of the walls of said reaction chamber, and (ii) bent upward and extended to the upper edge of one of the walls of said gas plenum that is directly above the second wall of said reaction chamber.

5. An arrangement in accordance with claim 1, wherein

the water tube panel that forms a first one of the walls of said reaction chamber comprises first and second water tubes,

at least a portion of the water tube panel that forms the bottom of the enclosure of said gas plenum is formed as an extension of the first water tubes of the water tube panel that forms the first wall of said reaction chamber, and

at least a portion of the water tube panel that forms one of the walls of the enclosure of said gas plenum is formed as an extension of the second water tubes of the water tube panel that forms the first wall of said reaction chamber.

6. An arrangement in accordance with claim 1, wherein said gas plenum is divided into at least two separate chambers by at least one partition that is formed by at least one water tube panel as an extension of at least one of the water tube panels of said reaction chamber.

7. An arrangement in accordance with claim 6, wherein

the water tube panel that forms a first one of the walls of said reaction chamber comprises first and second water tubes,

at least a portion of the water tube panel that forms the bottom of the enclosure of said gas plenum is formed as an extension of the first water tubes of the water tube panel that forms the first wall of said reaction chamber,

at least a portion of the water tube panel that forms one of the walls of the enclosure of said gas plenum is formed as an extension of the second water tubes of the water tube panel that forms the first wall of said reaction chamber, and

at least a portion of the water tube panel that forms the partition of said gas plenum is formed as an extension of the first water tubes of the water tube panel that forms the first wall of said reaction chamber.

8. An arrangement in accordance with claim 6, wherein

the water tube panel that forms a first one of the walls of said reaction chamber comprises first and second water tubes,

at least a portion of the water tube panel that forms the bottom of the enclosure of said gas plenum is formed as an extension of the first water tubes of the water tube panel that forms the first wall of said reaction chamber,

at least a portion of the water tube panel that forms one of the walls of the enclosure

of said gas plenum is formed as an extension of the first water tubes of the water tube panel that forms the first wall of said reaction chamber, and

at least a portion of the water tube panel that forms the partition of said gas plenum is formed as an extension of the second water tubes of the water tube panel that forms the first wall of said reaction chamber.

9. An arrangement in accordance with claim 1, wherein the water tube panels that form the enclosure of said gas plenum comprise water tubes and the enclosure of said gas plenum is at least partially formed as an extension of the water tube panel that forms one of the walls of said reaction chamber in such a way that a portion of the water tubes of the water tube panel that forms the wall of said reaction chamber is connected at the upper edge of the wall of said reaction chamber to a header, from which header the water tubes are extended to form a portion of the enclosure of said gas plenum.

10. An arrangement in accordance with claim 1, wherein there are at least three particle separators, and the discharge duct of at least one of the particle separators is connected directly to the connecting channel downstream of said gas plenum.

11. An arrangement in accordance with claim 10, wherein the connecting channel widens in the flow direction of the cleaned exhaust gases.